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INTRODUCTION

OVERVIEW

A securities market index is a statistical indicator, benchmark or measure of movements in the general level and direction of prices of financial instruments or securities such as stocks, bonds, money market instruments, commodities, convertible securities, currencies, Guaranteed Investment Contracts (GICs), mutual funds and real estate.

Securities market indices are alike in that they are ordinarily calculated based on standard forms of simple and composite index formulas expressed in relation to a "base" value that is established at the time of their inception and thereafter, on movements that are derived from a series of observations. Otherwise, just about every index, whether calculated continuously throughout the trading day, once daily, monthly or on a quarterly frequency, is constructed diferently in terms of its constituent universe and selection procedures, maintenance practices and computational methodologies.

An index may be based on the prices of all, or only a sample, of the securities whose value it represents. Approaches to sample selections are numerous and range from strictly objective methodologies to subjective guidelines that take into account common factors such as markets, market coverage, security type, economic sector/industry representation, size, trading volume, liquidity, company performance and the availability and quality of prices.

Indices are generally subject to periodic reconstitution, at which time securities may be added to the index or dropped from the index due to mergers, liquidations, declining capitalization and in the event a particular security is no longer thought to represent the type of security covered by the index. In any case, applicable guidelines, frequency and timing of additions and deletions vary from one index to the next.

To maintain continuity of an index and ensure that changes in the index level are attributed entirely to price movements during the trading day, indices must be adjusted from time to time to reflect various corporate actions, such as share issuances, share repurchases, special cash dividends, rights offerings and spin-offs. Here too, differences in methods and variations as to frequency and timing of implementation are in evidence. In addition, varying pricing sources and currency exchange rates, where applicable, and the treatment of dividends and interest in connection with total rate of return calculations, also contribute to variations among indices.

Securities market indices also differ from each other in the way constituents are weighted. Often, prices of constituent securities in the index are market value-weighted. That is, in calculating the index value, the market price of each security is multiplied by the number of shares outstanding or, in the case of bond indices, the amount of bonds outstanding. Pursuant to this method of calculation, changes in the prices of larger companies or companies with more shares or bonds outstanding will generally have a greater influence on the level of a market value-weighted index than price changes affecting smaller corporations. Examples of leading stock indices that weight members on a market value basis include the Standard & Poor's 500 Composite Stock Price Index (S&P 500), the FT-SE Actuaries All-Share Index in the United Kingdom (UK), and the Nikkei Stock Index in Japan. A few leading bond indices that weight members on the basis of market value include the Lehman Brothers Aggregate Bond Index, Merrill Lynch Global Bond Index and Salomon Brothers Broad Investment Grade Bond Index.

Index components may also be equally-weighted so that each index member has an equal influence on the results, or they may be unweighted, such that securities are combined strictly on the basis of quoted prices. This latter method of weighting characterizes the Dow Jones Industrial Average (DJIA), the oldest surviving and most widely recognized securities market benchmark in the world, as well as the Nikkei 225 Stock Average that was fashioned after the Dow. It is worth noting that indices, though typically based on averages, are not quite the same as averages. The difference consists of the fact that an index is constructed by setting its initial value equal to some arbitrary but generally rounded number at some point in time in order to facilitate comparison of the value of the index in subsequent periods. An average, on the other hand, does not involve the selection of an arbitrary value for some base period. It is simply an average. The Dow Jones Industrial Average and its companions are not indices technically. They are simply the arithmetic mean of the prices of the stocks included at each point in time adjusted for stock splits and other capital changes. Nevertheless, the two tend to be used interchangeably.

Finally, regardless of weighting methodology, index components are combined in one of two ways to arrive at an index value. The most common approach relies on arithmetic averaging, but geometric averaging is still in use both in the United States as well as overseas.

THE UNIVERSE OF INDICIES

Worldwide, it is estimated that upwards of 600 securities market indices are compiled and published by not less than 250 stock exchanges and publishing enterprises, including newspapers, investment banking concerns and investment management organizations. There may be nearly 10,000 in number when subindices, or strictly constructed narrower segments of indices, are taken into consideration.

New indices and subindices are frequently being introduced due to increased usage. For example, between January 1, 1994 and June 30, 1996, at least 118 new indices were launched throughout the world. Of these, 48 were launched in 1995, up from 38 that were introduced in 1994.[1] The pace of new index introductions continues, with at least 32 new indices (excluding subindices) making their debut by mid-1996.

While usage varies, whether for the purpose of performance evaluation, creation of derivative instruments, passive management, or the establishment of incentive fee arrangements, differences in construction, maintenance and calculation methodologies will affect how an index measures the relevant market. They can produce differences in the level and movements of indices over time and, in turn, the portrayal of the marketplace.

For example, the cumulative 10-year price only return to December 31, 1995 for broad equity indices such as the New York Stock Exchange (NYSE) Composite Index, the S&P 500 Index, Wilshire 5000 Equity Index and the Russell 3000 Index, which gained 171.02%, 191.52%, 179.82% and 183.38% respectively, varies by as much as 20.5%. During the same time period, annual price only returns have diverged by a maximum of 3% in a given year.

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[1] Excluding subindices. Also, indices designed to track market capitalization segments, such as large, medium and small companies, or stock characteristics, such as growth or value stocks, are each treated as one index.

The Guide to Securities Market Indices is designed to assist professionals as well as individual investors in the selection of an appropriate securities market index, on a worldwide basis. *The Guide's* purposes are to:

1. Identify and catalogue available performance indicators along with their publishers;
2. Describe their relevant characteristics; and
3. Provide a perspective on their historical price and total return performance.

The Guide to Securities Market Indices contains descriptive profiles along with historical performance data on 400 of the world's leading global, regional and local securities market indices and subindices covering 10 asset classes. In addition, over 200 indices are referenced in abbreviated form.

SELECTION CRITERIA

In addition to usage, indices for which descriptive profiles are provided were selected on the basis of the following considerations:

1. Asset class coverage.
2. Market coverage, including individual countries and regions and the world.
3. Coverage by market capitalization and style of management.
4. Availability of exchange-traded derivative instruments.
5. Perceived areas of interest.
6. Availability of adequate and reliable information.

Index descriptions, computation methodologies and historical performance data were, for the most part, obtained directly from their publishers in the form of written specifications and accompanying explanatory materials. Supplemental research was also conducted along with follow-up discussions, as appropriate, with index publishers. In some instances, historical performance data was obtained and/or verified using Bloomberg Financial and Interactive Data Services data bases.

The quality of descriptive materials in general and specifications relating to index calculation methodologies and maintenance procedures in particular, both in the U.S. and overseas, vary considerably. Except for documentation associated with indices of leading publishers and, in particular, index purveyors whose express goal is to ensure transparency in terms of component securities and construction methodologies, publishers in general offer limited disclosure and related documentation lacks precision. Often, index documentation may refer to the use of a standard formula, such as the Paasche index formula, without expanding upon factors such as the frequency and timing of constituent additions and deletions, adjustments for shares outstanding as well as corporate actions or pricing sources that could have meaningful price and total return implications over time. The profiles of indices that fall into this category have been prepared on a best effort basis using all available information. Future editions of *The Guide* will attempt to expand upon these considerations in a more methodical fashion.

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USES AND APPLICATIONS

MARKET PERFORMANCE

In their most basic form, securities market indices are designed to answer the fundamental question: "how did the market do today, yesterday or over any other chosen period of time?" This was the intent behind the creation of the Dow Jones Industrial Average (DJIA) in 1884, an early proxy for the performance of the stock market in the United States, as well as the predecessor to the S&P 500 that was introduced 39 years later. While relying on an entirely different and more complex computational methodology, the Standard & Poor's Index nevertheless expanded upon the popular and easy to understand DJIA by providing a broader market indicator that measured the changes in the value of a market portfolio.

PERFORMANCE BENCHMARK/STANDARD

Equally important, securities market indices are used to gauge or measure how well individual securities, an investment manager or a portfolio of securities, including separate accounts, pooled accounts as well as mutual funds, have performed. In this context, securities market indices facilitate performance comparison in that they provide a systematic basis for evaluating, monitoring and comparing the performance of individual securities as well as managed portfolios.

According to a quarterly survey of corporate and public pension fund sponsors conducted by *Institutional Investor* in 1995, 90.3% of respondents use a securities index, market index or style index to measure the performance of pension funds.[1] Also, securities market indices are now more frequently used by individual investors to measure the relative performance of their portfolios, Individual Retirement Accounts, 401(k) plan accounts as well as their mutual funds and their use of a benchmark is increasing over time.

PORTFOLIO STRUCTURE, RISK AND STYLE ANALYSIS

Beyond their application as a performance benchmark, securities market indices are used to describe the relationship between the return on a security or a portfolio of securities and the overall market, as represented by a broad based index, for purposes of establishing the trade-off between risk and expected returns.

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[1] "Measure for Measure," *Institutional Investor Magazine*, 1995, p. 195.

They also serve as a diagnostic tool to assess a portfolio's overall posture relative to the market and analyze its risk/reward profile. This is accomplished by comparing and contrasting such factors as security holdings, levels of exposure, and industry diversification, maturity and credit quality of an actively managed portfolio with the characteristics of an appropriate securities market index.

Lastly, indices are used to conduct return-based style analysis where manager styles are analyzed without evaluating portfolio holdings. Proposed by William Sharpe in 1988, style analysis evaluates whether an investment manager's marketed investment style conforms with its investment results. This is accomplished, using a factor model, by comparing historical investment performance results with that of selected benchmark indices. In effect, style analysis tries to find the portfolio of indices that best explains a manager's returns.

DERIVATIVE INSTRUMENTS

Indices are used as underlying vehicles for derivative products. In recent years, there has been a proliferation of exchange-traded as well as Over-the-Counter (OTC)-traded financial instruments such as futures, options and swap contracts that have been created using stock market indices and, to a lesser extent, bond market indices. As many as 112 stock, bond, commodity and real estate indices and subindices served as underlying vehicles for exchange-traded derivative products throughout the world at year end 1995.[3] Of these indices, 31 were introduced between 1994 and 1995. During the first six months of 1996, six stock and bonds indices along with 15 subindices were created to serve as underlying vehicles for exchange-traded derivative products.

This development has been in response to a variety of increasingly popular strategies involving futures, options, options on futures as well as other forms of structured instruments, which are intended to achieve various portfolio objectives, adjust the risk/reward characteristics of a portfolio and facilitate portfolio management activities. Some of these portfolio applications are as follows:

- To hedge or protect current investment or portfolio positions by writing index options or selling index futures to obtain protection against market swings and reduce volatility of the underlying returns. They may also be used for trading purposes and to enhance returns by taking advantage of risk arbitrage opportunities, such as when a futures contract is priced more attractively than the underlying stock index. Or, they may be used for speculation purposes on the anticipated direction of stocks, interest rates and commodity prices.

- To gain exposure to an asset class, a variety of markets, both domestically and overseas, as well as narrower, industry segments. Stock index options and futures, for example, offer investors as well as traders the opportunity to gain foreign equity exposure without actually buying foreign stocks with their attendant transaction costs along with custodial fees, and in some cases, exposure to difficult settlement periods. In international investing, for example, futures on the Tokyo Stock Exchange Price Index (TOPIX), which tracks the performance of all domestic common stocks listed on the First Section of the Tokyo Stock Exchange (TSE), can be used by investors as a cash equity substitute. In some cases, investors can gain easier access to an otherwise hard to penetrate market and often at less cost than by buying underlying securities, or where there are restrictions against foreign ownership. Also, they offer a way to implement Tactical Asset Allocation strategies to supplement or reduce portfolio exposure to a particular market due to short-term departures from long-term portfolio policies without effecting the underlying assets.

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[3] Country Basket Index Fund, Inc. and World Equity Benchmark Shares Foreign Fund, Inc. (WEBS), consisting of 26 and 22 markets, respectively, have been treated as two indices.

- To facilitate index fund management by allowing index funds to replicate the returns of stock indices. This is possible through the use of futures, options, swaps and other derivatives to maintain cash reserves while remaining fully invested, to rebalance without incurring excess transaction costs and to promptly redeploy new money in anticipation of individual security purchases. In index fund management, futures and options can be used to equitize cash due to cash inflows and dividend payments in order to minimize tracking error or the difference between the total return of the portfolio and the index.

PASSIVE INVESTMENT STRATEGIES/INDEXING

Securities market indices make it possible to manage portfolio assets through a strategy known as indexation. Indexation, or passive investing, is an investment strategy devoted to duplicating or matching the performance of a selected stock index, bond index or other financial index while minimizing management fees and transaction costs. The investment results of the target index are replicated by holding all, or in the case of very broad indexes that may also include illiquid securities, a representative sample of the securities in the index in the appropriate proportions based on relative total market value. Such a strategy does not rely on traditional methods of active portfolio management that typically involve frequent changes in the make up of a portfolio of securities on the basis of economic, financial and market analysis. Instead, the only purchases and sales that are made are those necessary to create and maintain a portfolio that substantially replicates the selected index.

REGULATORY REPORTING AND DISCLOSURE

The Securities and Exchange Commission (SEC) in the United States has adopted the following revisions and amendments to disclosure documents that are designed to give investors more information in order to evaluate corporate performance as well as the performance of mutual funds. The SEC requires corporations and mutual funds to compare their performance against a broad market index and a more narrowly constructed index consisting of peer group companies.

- In October 1992, the Securities and Exchange Commission adopted revisions to its rules governing disclosure of executive compensation in proxy and information statements as well as other Commission filings. In addition to consolidating requisite disclosure information in a series of tables and requiring a report on compensation decisions, the SEC also mandated the use of a line graph comparing total shareholder returns of the company against those of a broad market index and a narrower group of peers. The SEC is even more prescriptive concerning S&P 500 member companies in that they are required to use the S&P 500 as their broad market indicator.

- In April 1993, the SEC adopted rule and form amendments under the Securities Act of 1933 and Investment Company Act of 1940. The rule requires every equity, fixed income, balanced and hybrid mutual fund to compare its performance to that of an appropriate broad based securities market index, and to publish a graph of this relationship in its prospectus or annual report to shareholders.

ASSET ALLOCATION

Securities market indices are an integral part of the asset allocation process by which the amount of assets to be allocated among various investment alternatives is determined. Asset allocation has been the subject of increased attention largely due to a growing acceptance on the part of professional managers that the asset mix of a portfolio, more so even that the selection of specific stocks, is the single most important determinant of performance.

A number of approaches are currently being used to assess asset mix, but certain basic inputs are common to all. One of these involves forecasts of risks and returns for each asset class and the examination of historic relationships between them. An investor using this approach begins by examining a series of historic returns and these are typically in the form of generally accepted securities market indices. For common stocks, this includes such indices as the S&P 500 or the Wilshire 5000 Equity Index while the Morgan Stanley Capital International Europe, Australia and Far East Index (MSCI/EAFE) may be used as a proxy for the performance of international equities.

In addition, asset mix studies incorporate all assets in which an investor may have an opportunity to invest. Traditionally, these have been limited to domestic common stocks, bonds and money market instruments. In recent years, the number of investment class options has expanded to include foreign stocks of developed and emerging markets, real estate and synthetic Guaranteed Investment Contracts (GICs), to mention just a few. In response, additional securities market indices have been created to accommodate these areas of interest.

INCENTIVE COMPENSATION ARRANGEMENTS

In late 1985, the SEC liberalized the use of performance based incentive management fees. Subsequently, pension and endowment fund administrators turned to performance based fees as a means of directly tying manager compensation to portfolio results. Mutual funds and closed-end investment companies also employ incentive fee arrangements, though their use is more limited.

In each instance, performance-based fee arrangements reward a manager for investment performance above a specified benchmark or penalize a manager for below benchmark results. Typically, broad based securities market indices are used for this purpose, although a limited number of peer group universes are also in use. Whether in connection with pension fund portfolios or mutual funds, the most common benchmark remains the Standard & Poor's 500 Composite Stock Price Index.

TECHNICAL ANALYSIS

Securities market indices assist the technical analyst in the attempt to study, observe and record the daily performance of individual securities and the market as a whole in order to predict future market trends. Interestingly, the first theory of technical analysis was formulated by Charles H. Dow, creator of the Dow Jones Industrial Average. Known as the Dow Theory, its basic proposition of identifying market trends relies on both the Dow Jones Industrial Average and the Dow Jones Transportation Average to determine the market's direction.

AUDIT, SURVEILLANCE AND CONTROL

Securities market indices are useful devices for auditing and validating portfolio prices, particularly the net asset value (NAV) of mutual funds and other actively managed collective funds that must be valued on a regular basis within a restricted time period. In this context, benchmarks are used to confirm the prices of various domestic and foreign securities to ensure their accuracy before releasing data to the general public.

Also, the Dow Jones Industrial Average is used by the SEC as a mechanism for tracking and implementing so-called "circuit breakers" that are imposed on share trading on the New York Stock Exchange to avoid steep declines in share prices during the course of a single day.

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REASONS FOR GROWTH OF INDICES

In addition to growth that is directly attributable to new uses and applications, as outlined in the preceding Chapter, the following important developments have contributed to the expansion in the number and type of indices in recent years.

MEASURES FOR MANAGER SELECTION AND EVALUATION

Increased emphasis on manager evaluation, in general, and performance measurement in particular by institutional investors, such as corporate and public pension funds, endowments and foundations, have contributed significantly to the development and growth of indices over the last 25 years or so. Several factors in particular have been responsible for the increased reliance on numeric measures, including the passage of The Employee Retirement Income Security Act of 1974 (ERISA), changes to portfolio composition, competition for money management business as well as emphasis on pension cost reduction.

- The passage of the ERISA in September 1974 brought about at least two significant changes to traditional investment practices. First, ERISA adopted a "prudent man" standard for persons engaged in the administration, supervision and management of pension moneys according to which they assumed a fiduciary responsibility to ensure that all investment related decisions were subject to the ". . . care, skill, prudence and diligence that a prudent man familiar with such matters would use."[4] The second change mandated the requirement that investments be diversified so as to minimize the risk of large losses. The passage of ERISA ushered in the era of multi-manager arrangements in which several independent counseling firms were selected to manage pension fund assets on the basis of asset class management expertise, investment style and performance results over three- and five-year time horizons. Whereas banks and, to a lesser extent, insurance companies, dominated the defined pension fund asset management market, their share of market experienced a long and sharp decline following the recession of 1972 and shortly thereafter, the passage of ERISA. The rise of independent investment counseling firms and with them, the arrival of pension consultants to evaluate and monitor these new managers, placed greater emphasis on relative performance measurement and reliance on benchmarks.

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[4] Section 404(a)(1) of the Employee Retirement Income Security Act of 1974.

- The growth in the number of investment managers during this period served to intensify competition among managers, with performance evaluations becoming an increasingly important role in the screening and selection process.
- Portfolio composition has been expanded beyond traditional asset classes, to include emerging markets, real estate, commodities, and oil and gas, to mention just a few, and these have been followed by the introduction of new benchmarks to evaluate their performance.
- In recent years, a new emphasis by corporate pension funds on investment performance and a demand for greater accountability from their managers. As defined benefit plans grew in size and importance during the seventies and eighties, corporations realized that their levels of contributions and consequently, corporate performance, could be substantially impacted through more effective management of pension assets. Thus, greater emphasis was placed on the quality and frequency of investment manager evaluations through the use of performance benchmarks.

GROWTH OF MUTUAL FUNDS

Along a similar vein, the widespread acceptance over the last 10 years of mutual funds by individual investors as an investment vehicle of choice, either directly or through defined contribution plans, including 401(k) plans, has also increased emphasis on performance and performance measurement. The mutual fund industry now serves more than 38 million individual shareholders, represents about 31% of U.S. households, with over 7,000 stock, bond and money market mutual funds, at least 21 different investment objectives, and total net assets of approximately $3.0 trillion.

Diversity in fund types within the open end and closed-end funds universe has been accompanied by the introduction of new benchmarks. Also, widespread ownership of funds has made investors more sensitive to investment performance. In fact, investor purchase decisions are most heavily influenced by fund performance, which is evaluated and promoted on an absolute basis and in relation to a securities market index or peer group universe.

GROWTH OF INDEXATION

The expansion of indexation in the U.S. and, to a lesser extent, overseas has also been a factor in the growth and development of securities market indices. According to *Pensions and Investments*, the amount of indexed U.S. tax-exempt assets, including both separate accounts and mutual funds, reached about $730.3 billion at May 31, 1996.[5] This represents a market-adjusted increase of about 3.6% in six months when indexed assets stood at $676.5 billion.

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[5] Schramm, Sabine, "International Stock Index Funds Surge," *Pension and Investments*, August 5, 1996, p 1.

Reliance on indexing as part of a total investment strategy has gained acceptance among corporate pension fund sponsors and more recently, individual investors. The Efficient Market Hypothesis (EMH), which prescribes that, in efficient markets, all stocks are fully discounted for expected future events so that profit opportunities for active portfolio managers are severely restricted if not eliminated, along with corporate downsizing and low cost, have been important factors in indexation. In addition, manager underperformance has had an equally profound influence on the receptivity of indexation. According to data on the performance of general equity mutual funds in the United States during the 25-year period between 1971 and 1995, the S&P 500 Index rarely outperforms less than 30% of actively managed funds and often outperforms 70% of managed funds. In 1995, the S&P 500 Index outperformed 85% of actively managed general equity mutual funds.[*]

While most of the focus on index investing to date has been on the Standard & Poor's 500 Composite Stock Price Index, the use of indexing is growing steadily and is being applied to different categories of stock, both domestic and international, and fixed income investment. In recent years, the concept of indexing has been extended to encompass more narrowly defined market capitalization segments, i.e., small-, medium- and large-capitalization as well as styles of management, such as value and growth investing. As a result, new indices have been created to measure these segments.

NEW MARKETS, INVESTMENT STYLES AND SECURITY TYPES

Manager underperformance and the appeal of indexation, however, have not diminished investor appetite for various active management strategies that are designed to beat the market and/or avoid the risk of large losses through diversification. In response, investing has branched out to embrace additional asset classes such as real estate and commodities, new markets such as foreign and emerging markets, new industries consisting of the Internet and telecommunications, as well as new investment styles with their emphasis on growth and value investing within or across large-, medium- and small-sized company segments. These developments have been followed by the creation of indices designed to track these areas.

The creation of new security types, such as mortgage-backed securities, asset-backed securities and Brady bonds, has also generally been followed by the introduction of indices designed to quantify and track their performance.

NEW STOCK EXCHANGES

Growth in the number of new stock markets in recent years has contributed to the proliferation of new indices as benchmarks are created to track the performance of listed stocks and serve as hedging vehicles. Privatization of state owned enterprises has been the primary reason for the expansion in the number of stock exchanges, each of which provides a place to trade and value shares in privatized companies, and to attract foreign capital. This has been particularly pronounced in Eastern Europe where nations have been shifting from centrally controlled command economies to free markets.

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[*] Vanguard Index Trust 1995 Annual Report, pp 4-5.

Simultaneously, the proliferation of futures and options exchanges and the increased competition among them has also been a factor in the creation of new indices and subindices to track the local market and to serve as underlying vehicles for derivative products, both for portfolio management purposes and to build transaction volume.

COMPUTER TECHNOLOGY

Computer technology has made it easier to build new, more accurate indices, that can be computed on a more timely basis and with greater frequency, including intraday, minute by minute index calculations. When combined with the greater availability and access to underlying data, such as prices, dividends, shares outstanding, and share cross-ownership, the cost of building and maintaining indices is dropping.

PROMOTIONAL CONSIDERATIONS, ENHANCEMENT TO REPUTATION AND REVENUE SOURCE

The creation and regular publication of an index generates publicity for index publishers and therefore, serves as a useful device for promoting the firm before the public. The brand name recognition of firms like Standard and Poor's, Morgan Stanley and more recently, J.P. Morgan for its global government bond index, is both valuable and difficult to quantify. More important, it serves to establish the firm as an authority in the particular segment of the market and creates opportunities for revenue production, either directly or indirectly. The cost of developing and maintaining an index varies in relation to its complexity. At the low end, creation of an index requires an investment of about $35,000 to $45,000 while maintenance can run about $1,000 a month. Some entrants, however, reportedly invested in excess of US$2.0 million.[7] Nevertheless, the financial rewards can be substantial for the more widely accepted and used benchmarks. Revenue generating opportunities are available through licensing fees associated with indices used for passive products such as the S&P 500 and MSCI/EAFE, exchange-traded options and futures contracts, the creation of customized derivative products and related securities trading commissions, and the production and sale of financial data.

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[7] Ioannou, Lori. "Constructing Indexes," *Global Finance*, August 1991, pp 46-48.

4

INDEX CONSTRUCTION AND MAINTENANCE

INDEX COMPOSITION

Indices are based on an entire population of homogeneous securities or a sample intended to represent the universe under consideration. In either case, the objective is to properly describe the market or population of securities that is relevant to investors and portray the behavior of the financial asset that is being studied. The population may be broadly defined to incorporate an entire class of securities, such as stocks, bonds, convertible securities or real estate assets. It may be expressed on a global, regional, national or local level. It may consist of a particular market segment or sector, such as an economic sector, industrial group, investment objective or investable universe of securities. It may be limited by issuer or security size, such as large-, medium-, or small-capitalization stocks, large- or small-sized bonds or mutual funds investing in large- or small-capitalization stocks. Or, the population may be defined by the character of a security, such as growth or value stocks that are, in turn, isolated using price-to-book ratios, price-earnings ratios and divident yields, credit quality and/or maturity.

When indices were first constructed, before the advent of calculators or computers, the number of securities in an index had to be restricted to a few stocks. Otherwise, it would have been too difficult, time consuming and expensive to calculate an index on a timely basis. The Dow Jones Industrial Average for example, consisted of only 11 stocks when it was first published on July 3, 1884. Since then, developments in computer technology have made it possible to construct indices with a large number of securities that can be computed and disseminated quickly and less expensively. Standard & Poor's, which in 1923 introduced a broad market indicator consisting of 233 stocks, created a 90-stock subset that was published daily starting in 1928 and later on an hourly basis. Twenty-nine years later in 1957, the availability of computers enabled Standard & Poor's to calculate and disseminate the S&P 500 Index at one minute intervals. Today, computer technology enables Wilshire Associates to generate daily index values for its 6,972 stock Wilshire 5000 Equity

Index and Merrill Lynch along with Lehman Brothers to compute daily index values for broad based bond indices with 8,472 and 5,343 constituents, respectively.[*] Because of advances in computer technology, the selection of index constituents and any restrictions that may be applied to them is generally influenced by factors that are not strictly related to computational considerations.

SELECTION CRITERIA

Stock market indices that rely on a selection rather than the entire population of securities generally operate pursuant to a set of rules or guidelines governing the inclusion of markets, market segments and the individual securities. These rules not only apply to the initial selection process, but they also serve as the framework for ongoing maintenance that determines new entrants and deletions to the index. Often, markets, market segments and securities selection are based on qualitative and quantitative considerations that are predicated on usage, and may consider a combination of some or all of a number of factors, including markets, market coverage, security type, economic sector/industry representation, credit quality, size, trading activity, financial and operating characteristics, data quality, float/cross ownership, and liquidity.

MARKETS

Markets can be variously defined. For example, the International Finance Corp. (IFC), in constructing its IFC Global Index, defines an emerging stock market as any stock market located in a developing country as established by the World Bank's Gross National Product (GNP) per capita criteria. J.P. Morgan, for purposes of its Emerging Markets Bond Index (EMBI), defines emerging market countries based on their ability to repay external-currency denominated debt, using a Standard & Poor's and Moody's Investors Service rating ceiling of BBB+/Baa1.

MARKET COVERAGE

Some indices pursue a strategy of capturing a minimum percentage of cumulative available market capitalization. For example, the Dow Jones Global Stock Index aims to achieve 80% market coverage in each country based on market capitalization. To that end, all eligible stock issues are ranked by market capitalization and constituent stocks are selected from the highest capitalization within each industry in the market until the 80% level has been reached. Morgan Stanley Capital International, on the other hand, aims to capture a 60% level from a universe of available stocks in each market for its World Index.

SECURITY TYPE

Stock indices typically consist of common stocks and preferred stocks. Participation certificates and other securities, without regard to their voting status, may also be eligible. On the other hand, investment trusts, unit trusts, mutual funds and closed-end funds are typically excluded, but this is not always the case. Broad based bond indices generally include fixed-rate, publicly placed, dollar-denominated and non-convertible, investment grade debt issues with at least one year to final maturity. Non-fixed rate securities or stripped securities or securities with esoteric or one of a kind feature such as structured notes or range notes with coupons that depend on market indices and private placement securities are generally deemed ineligible for inclusion.

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[*] New Merrill Lynch Bond Index selection criteria, effective as of April 30, 1996, will drop about 2,500 issues from the index.

ECONOMIC SECTOR/INDUSTRY REPRESENTATION

Securities are selected to reflect the economic and industry characteristics of the overall market or market segments.

CREDIT QUALITY

Long-term ratings assigned by one or more of the leading rating agencies. These include Moody's Investors Service and Standard & Poor's Corp.

SIZE

Market capitalization, amount outstanding, contract size or, in mutual funds, total net assets.

TRADING ACTIVITY

Stocks, bonds or other securities are selected based on trading activity in terms of number of transactions, value or volume of shares traded during a specified period of time.

FINANCIAL AND OPERATING CHARACTERISTICS

Securities may be selected from such measures as sales, net income and industrial output. The Singapore Straits Times Industrial Index, for example, selects index constituents from a company's record of profitability for the three years before inclusion in the index. Additions to the S&P 500 are, in part, screened based on their financial and operating condition with a view toward minimizing company turnover and maintaining stability in the constituent universe.

DATA QUALITY

Availability of accurate, reliable and timely data concerning prices, interest and dividends and capital changes, which are essential to ensure reliable index values, may influence the selection of securities, particularly in emerging markets.

SELECTION FACTORS UNIQUE TO THE INSTITUTIONAL MARKETPLACE

The increased institutionalization of investing, interest in international investing generally and emerging markets in particular, combined with the growing acceptance of indexation, have served to emphasize the following two additional selection factors:

FLOAT/CROSS OWNERSHIP

Available float, or the percentage of shares freely tradable. This is difficult to determine, however, as good sources for information may not be available, it may not be made public or information may be subject to errors and time delays. Most important, float is often defined differently by different index publishers.

LIQUIDITY

This may be variously defined, but generally assessed based on trading value over a specified period of time, trading volume, market capitalization or face amount outstanding, bid/asked spreads, number of brokers making a market in a particular security, and the ability to affect settlement through a recognized settlement facility.

SELECTION METHODS/TECHNIQUES

Within this broad framework of selection criteria, indices generally employ the rank order method or the optimization technique or some combination of these two approaches to actually identify individual issues for inclusion in the index.

RANK-ORDER METHOD

The universe of eligible securities is determined through a process of elimination and index constituents are selected strictly based on their aggregate market value. Stocks are added to the index until a predetermined level of coverage has been achieved. This may include a specified number of securities, e.g., 30, 100, 300 or 500, or market coverage defined as a percent of market capitalization.

OPTIMIZATION TECHNIQUE

A process by which a number of selection variables are optimized to achieve the desired index or portfolio profile, including a predetermined number of securities or percent of market capitalization.

INDEX MAINTENANCE

The procedures applicable to the maintenance of an index are just as important as the criteria applied to the selection of its constituents.

Index maintenance involves the process of monitoring and, where appropriate, adjusting indices for company additions and deletions, and various corporate actions such as stock splits, rights offerings, share issuance, special cash dividends, stock dividends, spinoffs and corporate mergers.

Company additions and deletions are required periodically to maintain the character of the index, as with indices that track a specific number of constituents selected on market value. Such indices are typically reconstituted on a quarterly or annual basis. Constituent additions and deletions, however, may also be required in connection with mergers, acquisitions, spinoffs, and bankruptcies. Despite the reason, such changes have an effect on the market value of the index.

Similarly, issuer-related developments affect the market value of the index in a way that requires adjustments to the index divisor to prevent the value of the index from changing for reasons other than market related actions. The quality and timeliness of information regarding such adjustments, however, can vary from one market to the next. On the other hand, some corporate actions, such as stock splits, require simple changes to the index to reflect the revised number of shares outstanding.

The policies and practices that govern the implementation of corporate actions are equally important, if not more so. While shares outstanding and available share capital change constantly, daily updates and adjustments may not only serve to distort the integrity of the index but also make it difficult, if not possible, to establish indexed portfolios. Thus, index publishers face the challenge of maintaining a balance between the mathematical properties of the index and its long term validity as an indicator of market activity.

While detailed disclosure in this area is limited, in general, maintenance adjustments are implemented on a weekly or monthly basis, or with less frequency, on a quarterly or annual basis. The world's leading indices monitor and implement maintenance adjustments on a more frequent basis. For example, the Standard & Poor's 500 Index, is monitored on a daily basis and share changes of less than 5% are implemented quarterly. Share changes in excess of 5% are reviewed and, if appropriate, implemented after the close of trading on the following Wednesday of the week. At the other end of the spectrum, some indices are reviewed and adjusted once a year.

Due to changing market conditions, markets and country selections tracked by world and regional indices are subject to periodic review that is also likely to require maintenance adjustments on these levels. Such reviews typically take place on a quarterly or annual basis.

PRICING/FOREIGN EXCHANGE

Index results are influenced by choices made regarding what prices to use. Intraday as well as closing prices applicable to actively-traded common stocks are generally obtained from third party pricing sources that track transaction activity in local markets on the primary stock exchanges. Even in the United States, subtle differences in index results are introduced by the selection of one pricing source over another, such as the use of New York Stock Exchange closing prices versus composite closing prices. These differences are likely magnified concerning smaller and less actively traded stocks and especially in pricing fixed income securities, where prices, either trader quotes or matrix generated, can vary considerably, or may not be available at all.

Likewise, sources for financial exchange rates, the time of day that these rates are taken and methods of averaging, if any, can influence index results. In this regard, a number of world index publishers adopted in October 1994 the WM/Reuters Spot Rates as of 4 PM London Time as a convention for exchange rates.

OTHER CONSIDERATIONS

Particularly concerning indices that track a large number of securities, both domestically and across national borders, or emerging market indices, there are potential sources for error that can serve to distort index results with compounding effects over time. These consist of errors in prices, errors as well as delays associated with the receipt of information on corporate changes, various operations errors as well as transmission errors.

While errors are inevitable, the long-term validity of index results rests largely with the practices and procedures used by index publishers to monitor, identify and correct errors. This is no small task, requiring a significant commitment of resources, such that actual practices vary considerably. In fact, a limited number of index publishers actually disclose their practices in this area. The FT/S&P World Index is one benchmark that does employ a variety of validation and error checking mechanisms, duplicate processing and third party confirmation, combined with published recalculation guidelines in case of errors that distort a country index by more than 25 basis points or 10 basis points for the World Index.

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CHARACTERISTICS OF PREFERRED INDICES

Indices should be constructed, maintained and calculated according to a set of published objectives, including rules and guidelines. These should offer interested parties an opportunity to properly assess a benchmark in terms of how it measures the relevant market and its application to their own particular situation.

While investor requirements and actual usage are likely to differ, indices should be evaluated against the following attributes that are associated with well constructed indices:

- The index should be relevant and appropriate. That is, the index should track the relevant markets, market segments, instruments, individual securities and investment style.
- The index should be comprehensive, or broad based, incorporating to the extent appropriate, the markets, security types and individual securities that reflect the investment opportunities available to investors.
- The index should be investable and market participants should be able to replicate it. A useful index consists of securities that can be purchased by investors, local and foreign, retail and institutional investors. To ensure investability, an appropriate benchmark should qualify based on float capitalization, liquidity, and the absence of ownership restrictions.
- The index should be transparent. In addition to information regarding security selection and maintenance policies involving the addition and deletion of companies, calculation methodologies and related practices should be disclosed by the index publisher. Actual changes, if any, should be announced prior to implementation. In some cases, securities eligible for inclusion in the index at a future date due to maintenance adjustments will be identified in advance.
- The index should be constructed so that each security's return is weighted according to its market value at the beginning of the period the return is measured. Also, the performance of component stocks, bonds or other securities should be arithmetically averaged.

- The index should be maintained accuratly and reliably, with a stated corrections policy regarding prices, capital changes, dividends, exchange rates, etc., to reflect the actual changes in the value of the portfolio instead of the influence of other factors.

- In addition to price only returns, the index should also measure total rates of return. The latter includes cash dividends recorded in the period received and reinvested at the earliest date in the market. With bonds, total rates of return should include the reinvestment of interest income received or accrued, as may be appropriate, and principal payments, if applicable.

- Index results should be published frequently, be disseminated on a timely basis and be readily available to investors.

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HISTORICAL HIGHLIGHTS

1834

The earliest dated stock price index in the United States, one in a series of railroad stock price indices published by Cole and Frickey, includes one series consisting of eight railroad stocks calculated back to 1834, using an unweighted geometric average of stock prices. By the turn of the century, at least 14 U.S. index publishers and two firms in Europe–the Statistique Générale de la France and the London and Cambridge Economic Service in the UK–were offering stock market indices with historical data prior to the year 1900.

1864-1874

German economists Etienne Laspeyres and Hermann Paasche advocate the use of a formula in which the price of each index constituent is weighted by the number of shares outstanding and the product is divided by the product of the prices of each index constituent weighted by the shares outstanding as of the base date. This general method, widely used today, was first proposed for use in comparing the relative changes in the prices of various commodities.

JULY 3, 1884

The Dow Jones Industrial Average made its debut in a two-page financial bulletin entitled "Customer's Afternoon Letter" which was the forerunner to *The Wall Street Journal*. It consisted of a list of 11 stocks, nine railroads and two industrial companies, that was calculated by adding up the closing prices of these stocks and dividing the total by 11. The index was one of the three or four indices available at the time and the oldest surviving proxy for the performance of the U.S. stock market. It was compiled by Charles Henry Dow, the first editor of *The Wall Street Journal* and co-founder, in 1882, of Dow Jones & Co., in response to a need for a market barometer to reflect the general movement of stocks in the United States.

Over the next 12 years, Charles Dow experimented with different lists of stocks in an effort to develop an index consisting entirely of industrial stocks. On May 26, 1886, the first industrial stock average consisting of 12 industrial issues was published. Like its predecessor, this average was computed in the same manner by adding up closing prices and dividing the total by 12. At the same time, Dow also created a 20 stock railroad average (later becoming the Transportation Average) and publication of the two averages began October 7, 1896 on a continuous basis. The list of 12 companies was expanded to 20 in 1916 and to 30 in 1928.

1923

The predecessor of today's Standard & Poor's Corporation pioneered the Standard & Poor's Composite Index. Standard & Poor's, which is today owned by McGraw Hill, was formed in 1941 with the merger of Poor & Co. (founded by Henry Varnum Poor) and the Standard Statistics Bureau (founded by Luther Blake).

The S&P Index was created to address the needs of the professional investor to compare directly the performance of their stock portfolios to a stock market indicator that measured the changes in the value of a market portfolio. The index was computed using a "base-weighted aggregative" technique derived from the Paasche index formula. (The current index is expressed in relatives with the base market value represented by an average of the 1941-1943 period set equal to 10.)

The Standard & Poor's Composite Index tracked 233 stock issues and covered 26 industry groups for which individual indexes were also calculated. Index values were computed weekly but in response to a need to disseminate its market indicator information more frequently, a 90-stock composite, featuring daily calculations, was begun in 1926. The 90-stock composite index, which was calculated in addition to the 233 stock index, consisted of 50 industrials, 20 rails and 20 utilities. Daily publication of the 90-stock composite index was initiated in 1928.

DECEMBER 25, 1929

On this date, Dow Jones introduced a utility average. Then, on November 11, 1933, the Dow Jones Composite Average was introduced. This index was calculated by combining the three Dow Averages, including the Dow Jones Industrial Average, Transportation and Utility Averages.

1930'S

Alfred Cowles developed a stock index that partially satisfied the broad criteria for a well constructed index. His index, for New York Stock Exchange stocks, was the first to measure total returns and to weight these returns correctly for as large a population of stocks. However, the index used the average value of the market price each month, rather than a stock's end of month value, so that returns, over a given period, can only be approximated. Nevertheless, the Cowles index provided valuable data.

1935

The Financial News, a London publishing company which was later absorbed by the *Financial Times*, introduced the Financial Times Index. At the time of its introduction, it was known as the 30 Share Index in recognition of the number of constituent shares making up the index. Calculated once a day, this geometric index is one of the nine or so stock indices in the world still calculated on this basis. The Financial Times Index was followed up in 1962 with the introduction of the Financial Times-Actuaries Share Index covering over 700 constituent shares.

1948

The National Quotation Bureau introduced the Over-The-Counter Industrial Index. This index included 35 companies all having a market value of over $10 million and a large group of shareholders.

SEPTEMBER 5, 1950

Nihon Keizai Shimbun, Inc. introduced the Nikkei 225 Stock Average. The index was fashioned after the Dow Jones Industrial Average in terms of its simple arithmetic average calculation methodology.

1955

The New York Stock Exchange (NYSE) began producing a broad measure of stock price movements. Called the Stock Price Profile, this indicator provided a frequency distribution of percentage price changes over a given span of time. It was limited to 300 issues, usually representing slightly less than three quarters of the total market value of all the NYSE-listed stocks. As it fell short of representing a succinct figure describing what happened to the market, the Exchange, which benefited from its new computerized Market Data System, advanced to a point where it could produce, efficiently and economically, a stock price index that would be useful to the investing public. Thus, on July 14, 1966, the NYSE began to publish the new NYSE Composite Index and subindices.

1957

The S&P Composite Index was expanded to include 500 stocks, with 83 individual industry groups, which formed three main sector groups: The industrials with 425 stocks, utilities with 60 stocks and rails with 15 stocks.

1968

Capital International, S.A., the Swiss subsidiary of the Capital Group, Inc., created the first international performance benchmark designed to track the world's developed markets. The right to the index was acquired in 1986 by Morgan Stanley.

JANUARY 1973

Lehman Brothers introduced the Lehman Government/Corporate Bond Index, which was expanded to include mortgage-backed, Yankee securities and the Aggregate Bond Index in January 1986.

MID-1981

International Finance Corporation, a subsidiary of the World Bank, initiated a series of indices based on the 10 to 20 most active stocks in each of 10 emerging markets.

MARCH 1, 1983

The Chicago Board Options Exchange developed the CBOE 100 Index (subsequently renamed the S&P 100 Index) and options on the index commenced trading on this date.

JULY 1983

The Federation of International Bourses de Valores (F.I.B.V.) adopted voluntary common computation guidelines for the production of a stock return index, pursuant to "FIBV Standards." These specify a weighted index composed of all domestic shares listed on the individual stock exchange, the addition of paid dividends as of the ex-dividend date for total rate of return results and a computation method derived from the Paasche index formula

1987

Frank Russell Co. introduced the Russell series of equity indices, including the Russell 2000 Index of small capitalization stocks.

JANUARY 1, 1988

Standard & Poor's began daily calculation of a total rate of return version of the S&P 500 Index. Previously, total return performance was calculated with dividends reinvested either monthly or quarterly.

DECEMBER 1989

J.P. Morgan introduced the J.P. Morgan Government Bond Index, a family of indices consisting of regularly traded government bonds of 11 countries.

JUNE 5, 1991

Standard & Poor's launched the MidCap 400 Index, consisting of an investable universe of middle capitalization stocks.

DECEMBER 1991

The Association of Investment Management and Research (AIMR) published standard methodology guidelines for investment managers to use in presenting their performance records to the public. These became effective on January 1, 1993.

MAY 1992

Standard & Poor's and BARRA introduced the S&P/BARRA Growth and Value indices.

AUGUST 1992

J. P. Morgan introduced the Emerging Market Bond Index, a total return index that tracks emerging market debt instruments.

DECEMBER 1995

Frank Russell Company and Nomura Research Institute introduced a Japanese total market index and an equity style index series designed to track large-, middle-, and small-capitalization stocks. The index series is further delineated by growth and value orientation.

JULY 1, 1996

Dow Jones renames its Dow Jones World Stock Index to Dow Jones Global Index and is the first index publisher to calculate an entire global index on a "real-time" basis.